PPD Engineering Document Review Guidelines

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1.0 Introduction

1.1 Document Usage - These written guidelines should be used for the following purposes:

1. To determine the level of review that needs to be performed on an engineering document.
2. To determine how a reviewer is assigned.
3. To delineate how the reviewer should review the document.

2.0 Definitions

2.1 Engineering Documents - Engineering documents cover a wide variety of topics and are produced in a variety of formats. Engineering documents are typically written by an engineer to document their design work and any calculations performed to assess specific design components. Drawings are also considered to be engineering documents.

2.2 FESHM Engineering Documents – FESHM has many chapters, in which specific requirements for written engineering documentation are incorporated. Any engineering documentation required by FESHM must follow the specific guidelines laid out in the corresponding chapter, and these supersede the guidelines presented here.

2.3 High Risk Review – A high risk review is an engineering document review where the document is associated with a task or project labeled as high risk via the Fermilab Engineering Manual risk assessment spreadsheet presented in the Engineering Design Review Chapter of that document.

3.0 Level of Review Required

3.1 Risk Decision – The complexity of a document review will vary depending on the risk associated with the task or project that the document is associated with. If the task or project is determined to be high risk per the Fermilab Engineering Manual, a formal document review as defined within the Fermilab Engineering Manual must be performed. If the task or project is classified as being of standard risk per the Engineering Manual, then the supervisor of the individual that authored the engineering document, who initially assigned the work, should determine as part of the initial risk assessment whether an internal department review is required.

3.2 Supervisor's Guidelines - If an employee under your supervision has authored an engineering document and the Engineering Manual risk assessment shows the associated task or project to be of standard risk, good engineering judgment should be used as to whether the document needs to be internally reviewed by another department member. If the author is experienced and has successfully completed similar engineering documents in the past, then it may be that no internal review is required.

4.0 Assigning a Reviewer

4.1 Selecting Reviewers - If the task or project associated with a document is determined to be high risk per the Engineering Manual risk assessment, then a review should be arranged through the PPD ES&H Group or PPD division management in consultation with the management of the department to which the work was assigned. In other cases, it is sufficient for the supervisor of the individual that authored the engineering document to either assign a reviewer or request a reviewer from another group within the department, depending on the availability and subject matter expertise of the potential reviewers.

5.0 Reviewer Guidelines

5.1 Review Requirements – The review of engineering documentation requires the following components:

1. Assure the correct engineering standards have been followed. If no standards are found to apply directly, then good engineering judgment should be used.
2. Spot check the document for proper usage of the standards that apply, or spot check that good engineering judgment was used.
3. Check for grammar and spelling errors in the document.
4. Drill down into a few of the calculations presented in the document to verify their accuracy.
5. If any spot check or drill down reveals significant problems, then expand the review to ensure that there are no additional problems with methodology.

5.2 Reviewer Procedures – An individual assigned to review an engineering document should proceed through the following steps:

1. Collect the documentation to be reviewed and briefly go through it.
2. Establish communication with the author of the engineering document and obtain estimates for when the review needs to be completed and how long it took to perform the documented analysis.
3. Make an estimate of how many hours it will take to review the documentation. If this estimate is greater than 25% of the estimated time it took the author to produce the document, discuss the issue further with your supervisor before proceeding further with the review.
4. Carefully read through the documentation and perform the necessary review components outlined in the Review Requirements section of this note.
5. Communicate with the author concerning any potential errors uncovered or issues noted.
6. After the author addresses any concerns raised in step 5, repeat steps 4 and 5. If in the course of this iterative process, it becomes clear that the needed review completion date cannot be met or that the review effort is going to exceed 25% of the estimated time used to create the original document, discuss the situation with your supervisor.
7. Sign off on the documentation and include any notes or issues

8. If at any time during this process, the reviewer comes to believe that the review requirements cannot be met in a timely fashion, the individual should discuss the situation with their immediate supervisor to understand how to proceed.

5.3 Supervisor's Guidelines – If an employee informs you that the review of a document to which they have been assigned will either not be able to be completed by the needed date or will require an effort larger than 25% of the original effort required to complete the document, examine the situation and attempt to reduce the required effort from the reviewer by asking the author of the note to supply additional information. For example, if a reviewer is not familiar with a particular method for calculations documented within a note, ask the author to provide documentation establishing the validity of the method rather than having reviewer perform his own research to understand whether the method is acceptable.

6.0 Additional Review Information

6.1 Disclaimers - The material presented in this document is intended to specifically address the procedures associated with the initial review and sign-off of engineering documents. The information presented here should not be construed to exclude the need for potential, further reviews of an engineering component such as those that would be associated with an Operational Readiness Review. In general, it is expected that the results of an initial document review would be a necessary component of the package provided to an ORC committee.